

**Health & Safety**

**Worker Health and Safety Branch**

**Report**

**HS-1768**

**OVERVIEW OF THE CALIFORNIA PESTICIDE ILLNESS  
SURVEILLANCE PROGRAM**

**- 1995 -**

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## **Pesticide Surveillance in California, 1995**

The California Department of Pesticide Regulation (DPR) maintains a surveillance program to record human health effects of pesticide exposure. California law requires physicians to report any cases they know or have reason to believe derived from exposure to pesticides. To supplement physician reporting, DPR staff review workers' compensation cases for evidence of pesticide involvement. County agricultural commissioners investigate all cases identified as potentially related to pesticide exposure.

Every pesticide active ingredient has a pharmacologic effect by which it controls its target pest. Humans may be vulnerable to that pharmacologic effect, and this illness surveillance program attempts to locate and record such incidents. Pesticide products may have other potentially harmful properties in addition to the ones that work to control pests. This surveillance program includes as adverse effects of pesticide products the effects of any components of those products, whether active ingredients, inert ingredients, impurities, or breakdown products. Whether pesticide products act as irritants or as allergens, through their smell or by causing fires or explosions, DPR's mission is to place sufficient limits on their use to avoid exposures that compromise human health. Accordingly, this surveillance program records all of the types of effects mentioned above.

DPR maintains this record in order to document and evaluate the circumstances of pesticide exposures that result in illness and to alert regulatory officials to possible pesticide-related problems. Staff regularly consult the data collected to evaluate the effectiveness of the DPR pesticide safety regulatory programs and assess the need for revisions.

## Background on the Reporting System

The Department of Pesticide Regulation (DPR) worker safety program is widely regarded as the most stringent in the nation. It includes requirements for thorough data review of all pesticides<sup>1</sup> prior to registration for use in California, safety training of all pesticide handlers and field workers, and ongoing monitoring of people and the environment to detect potential for pesticide exposure. Mandatory reporting of pesticide illnesses has been part of this comprehensive program since 1971. In a report issued in December 1993, the U.S. General Accounting Office noted that "California had by far the most effective and well-established monitoring system in place" and that the U.S. Environmental Protection Agency (US EPA) "relies heavily on the pesticide illness data collected by the California monitoring system... and has tried to encourage selected states to develop monitoring systems modeled after the California system."

Under a statute enacted in 1971 and amended in 1977, California physicians are required to report any suspected case of pesticide-related illness or injury by telephone to the local health department. The health department informs the county agricultural commissioner and also completes a Pesticide Illness Report (PIR), copies of which are distributed to the State Office of Environmental Health Hazard Assessment, to the California Department of Industrial Relations (DIR), and to the Department of Pesticide Regulation (DPR).

Because the required illness reports are not always provided, DPR's Worker Health and Safety Branch (WH&S) also reviews reports of worker illness and injury submitted to DIR under workers' compensation reporting requirements. Any report that mentions a pesticide, or

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<sup>1</sup> "Pesticide" is used to describe many substances that control pests. Pests may be insects, fungi, weeds, rodents, nematodes, algae, viruses or bacteria -- almost any living organisms that cause damage or economic loss, or transmit or produce disease. Therefore, pesticides include herbicides, fungicides, insecticides, rodenticides, disinfectants, as well as insect growth regulators. In California, adjuvants are also subject to the regulations that control pesticides. Adjuvants are substances added to enhance the efficacy of a pesticide, and include emulsifiers, spreaders, and wetting and dispersing agents.

pesticides in general, as a possible cause of injury is selected for investigation. Reports that mention unspecified chemicals also are investigated if the setting is one in which pesticide use is likely. Reliance on reports of illness and injury treated under workers' compensation results in a surveillance program that records primarily occupational exposures.

The agricultural commissioner of the county where the incident occurred investigates all cases, whether identified by direct physician reporting or by review of workers' compensation reports. DPR provides instructions, training and technical support for performing investigations. The commissioners prepare reports describing the circumstances in which pesticide exposure may have occurred and any other relevant aspects of the case. If additional affected people are encountered in the course of an investigation, they are identified in the report and entered into the database.

Staff of DPR's Worker Health and Safety Branch (WH&S) evaluate the commissioners' reports and classify them according to the circumstances of exposure to a pesticide and the likelihood that such an exposure would have resulted in the problem experienced. This can be complex, and the results should be interpreted in light of the policies applied: As explained above, DPR intends this program to record adverse effects of pesticides on health. Concern extends to all components of pesticide products, not just the active ingredients, and to any type of effect the products may have on health. For instance, a documented allergic response to a pesticide would be recorded as a definite adverse effect, although it has nothing to do with the way the pesticide acts on pests.

Database information feeds back into the regulatory programs and is used to develop or support proposals for the California pesticide registration program and the US EPA's Label Improvement Program. Additionally, illness investigations focus attention of enforcement staff on locations where excessive exposures are suspected.

Despite the effort invested and the preeminence of the system, the completeness of the reporting system is an ongoing concern. People who do not consult physicians are unlikely to come to the attention of the system. The likelihood is very good, however, that people treated for acute illnesses under workers' compensation will be reported to DIR, where review by WH&S will recognize those cases in which pesticides are implicated. Although this should be sufficient to identify problems with pesticide use, it limits the conclusions that can be drawn about the total number of people affected.

### **Attempt to improve reporting compliance**

DPR initiated an effort in 1994 to improve physician familiarity and compliance with the reporting requirement. Besides identifying cases that might escape detection otherwise, direct physician reporting allows DPR to investigate cases promptly, while the people involved remain accessible, with accurate recollection of the event. About half of all direct physician reports arrive within two weeks of the occurrence, and nearly 90% within the month following exposure. About three quarters of the cases identified through workers' compensation records are more than a month old by the time they are located.

Late in 1994, DPR and the Department of Industrial Relations sent summaries of the requirements for reporting pesticide-related conditions to all physicians who held active California medical licenses. During 1995, DPR sent 635 notification letters to doctors who reported apparent pesticide cases to the workers' compensation program but had failed to report to the pesticide illness surveillance program. Simultaneously, the Office of Environmental Health Hazard Assessment conducted outreach training in Orange, Riverside, and Stanislaus Counties, stressing the importance of reporting pesticide cases. Notifications and outreach efforts both continued through 1996.

### **1995 Numeric results -- totals**

During 1995, DPR received reports of 2,401 people whose health may have been affected by pesticide exposure. After investigation, analysts found that pesticide exposure had been at

least a possible contributing factor to 1,593 of the 2,401 cases. Of those 1,593 cases, 656 (41%) involved use of pesticides for agricultural purposes and 937 (59%) occurred in other settings.

In 1995, DPR investigated 406 more cases than in 1994. Improved physician reporting accounts for much of the increase. In 1994, doctors filed direct reports on just 310 of the 1,995 cases investigated. Among the 2,401 cases investigated in 1995, DPR received 529 direct physician reports. Occupational exposures (those that occurred while the affected people were at work and eligible for workers' compensation) accounted for 2,043 of the 2,401 cases identified.

### **Agricultural field residue incidents**

Two large episodes of exposure to field residue occurred during 1995. Sixty-four workers developed rashes after turning cane in a vineyard that had received two applications of propargite nine days apart. All of these cases were classified “probable”. In another episode, miscommunication resulted in 20 illnesses among harvesters entering a watermelon field just an hour after it was sprayed with bifenthrin, dicofol, and endosulfan.

Including people involved in the two group episodes described above, 230 cases were classified as reactions to field residue, including 94 classified probable or definite and 136 considered possible. From the earliest computerized records of 1982 through 1988, an average of 279 cases per year were definitely, probably or possibly related to field residue exposure. Regulatory changes to restricted entry intervals took effect between the 1988 and 1989 growing seasons. Subsequently, the average number of cases related to field residue dropped to 149 per year for 1989 through 1994.

## **Morbidity and mortality**

Of the 1,117 cases evaluated after investigation as definitely or probably related to pesticide exposure, 12 were hospitalized and 212 lost time from work. Of 476 possible cases, two were hospitalized and 99 lost work time. Of four 1995 fatalities investigated, only one proved related to pesticide exposure. That one involved a transient who died after breaking into a motel under fumigation.

## **Examples of the importance of following label instructions**

Severe intoxications often result from disregarding label instructions. The following episodes came to DPR's attention during 1995. In each of them, people used pesticides irresponsibly, jeopardizing their own health and others'.

Without consulting the label, a resident prepared a very strong insecticide dilution, using four to eight ounces of concentrate where a spoonful probably was called for. She treated her yard with this on a windy day, wearing casual clothes, and reported "getting the stuff all over me". The next day she became weak and dizzy, suffering headache, blurred vision, diarrhea, and heart palpitations. She recovered after four days in the hospital.

Another resident combined some insecticide he had purchased with a small amount of water and an unidentified product left by the prior occupant. He applied this excessively concentrated mixture around his home, and allowed some material to drip into his boot. Even after completing the application, he did not wash off the pesticide. He became sweaty and nervous the next day, and vomited repeatedly. As the day progressed, he developed tunnel vision and slurred speech, and became confused. One day of hospital treatment restored him to health.

A homeowner treated her house with at least seven cans of insecticide fogger. She did not follow label instructions to extinguish pilot lights. The home exploded a few minutes later.

Fire fighters responded to the emergency and declared the structure unsafe to enter. They found 57 fogger cans in the house. No one was injured, but damage to the building and its contents was estimated at \$130,000.

Unrelated to the above episode, a resident who did not speak English discharged nine foggers in his small apartment without extinguishing pilot lights. He suffered minor burns in the ensuing explosion.

A farmer soaked sunflower seeds in pesticide and set them out as squirrel bait. Four neighborhood children were hospitalized overnight after finding and eating the sunflower seeds. This continues a series of episodes in which adults' careless and illegal pesticide handling has endangered children's health.

### **Responses to review of illness data**

Review of accumulated case histories identified several potential problem areas:

A series of cases among pet groomers led DPR to investigate their use of pesticides. Visits to several dozen establishments revealed that groomers received little if any safety training, and that typically they immerse their hands in pesticide solutions without using any safety equipment. In response, DPR developed a fact sheet for pet groomers and another for their customers. Copies of the fact sheets are available through the agricultural commissioner's offices in each county and from the DPR web site, [www.cdpr.ca.gov](http://www.cdpr.ca.gov). DPR mailed copies of the fact sheet for groomers to about two dozen organizations, publications, businesses, and other interested parties likely to address pet groomers or veterinarians. The cover letter encouraged the recipients to distribute the fact sheets or reproduce them in their own publications. Some of the recipients requested and received additional copies of the fact sheet.

DPR also initiated discussions on this subject with the U. S. Environmental Protection Agency (U.S. EPA), the only agency with authority to require changes in pesticide label instructions. Recent communication with U.S. EPA indicates progress in developing protective requirements for pet groomers.

Investigation of problems that began when a homeowner treated his crawl space with copper naphthenate initiated a review of the history of complaints related to this type of usage. When U.S. EPA was apprised of our concerns, the agency agreed that indoor use of naphthenates was inappropriate. US EPA has taken the lead in negotiating label changes that will exclude indoor use of both zinc and copper naphthenate.

Among people exposed to methyl bromide, those who prepare ground for planting trees (tree hole fumigators) stand out for the severity of their injuries. These people use hand-held probes to inject methyl bromide into the ground. If they contaminate their shoes or boots, they can burn their feet very badly. DPR approached a methyl bromide registrant about this problem. Since the company provides their customers with the application probes, they were well-situated to address the issue. Prototypes for improved probes are being tested. When tests demonstrate that a modified probe provides improved safety to users, agricultural commissioners will recommend the modified probes to users who apply for restricted materials permits for tree hole fumigation. In the interim, DPR has notified the county agricultural commissioners of the problem and recommended that they stress appropriate training for workers who may be at risk for this sort of injury.

In another cooperative effort with U.S. EPA, DPR reviewed illnesses attributed to cholinesterase inhibitors. In performing this review, we were unable to interpret many blood tests because of differences in the ways laboratories reported their results. Following up on this shortcoming, we surveyed the laboratories approved to test for cholinesterase and found that sample handling and assay procedures as well as reporting method varied among laboratories. Accordingly, we solicited the assistance of the University of California at Davis

(UCD) to investigate the significance of variations in test procedures. Based on the results of the UCD study, DPR has proposed a regulatory change to require reporting the results of cholinesterase tests in standard units.